

REMARKS

The Examiner objected to the amendment to the specification filed August 7, 2008. The amendment at page 2, paragraph 2, of the prior Office Action has been amended. Support for the amendment is page 16, line 21, to page 17, line 1, of the Specification as filed. With this amendment, Applicant believes that the amendment at page 3, paragraph 3, is in compliance with 35 U.S.C. §132.

The Examiner objects to claims 11, 16, and 31. Applicant has canceled claims 11 and 16. Applicant respectfully submits that claim 31 is in proper dependent form under the infringement test. Under the infringement test, the test as to whether a claim is a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112, fourth paragraph) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim. The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if claim 1 recites a specific product, a claim for the method of making the product of claim 1 in a particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim. Applicant submits that claim 31, as amended, complies with the infringement test.

The Examiner rejects claims 12-20 and 41 under 35 U.S.C. §101 as being directed to non-statutory subject matter. The Examiner states that claim 12 recites a system that does not positively recite any elements that necessarily constitute a system or apparatus, such as computer hardware, but rather is directed to software. In point of fact, the Examiner overlooks the fact that hardware *is* recited by claim 12 in that it requires certain operations to be performed by a computer.

Applicants disagree with the Examiner's position. In the Request for Comments on Proposed Examination Guidelines for Computer-Implemented Inventions, a "computer or other programmable apparatus whose actions are directed by a computer program or other form of "software" is a statutory "machine." Thus, claim 12 falls within a statutory category.

Claim 12 is directed to functional subject matter as is directed to a computer program which imparts functionality when employed as a computer component. (MPEP 2106.01.)

Descriptive material, when combined with a computer-readable medium or computer is statutory if it “defines structural or functional interrelationships between the computer program and the rest of the computer which permit the computer program’s functionality to be realized.” Claim 12 recites such interrelationships. By way of example, the last paragraph of claim 12 recites:

wherein said scheduler is operable, by the computer, to monitor each of said calendars and, upon the start of a non-business time for a selected calendar, place a time delay corresponding to the length of said non-business time into the queue associated with the selected calendar, whereby the non-business-time period is ignored in determining the at least one of a service time and time remaining in queue for at least some of the work items in the queue associated with the selected calendar.

Moreover, claim 12 is directed to a physical transformation and produces a useful, concrete, and tangible result. The transformation is to service a work item by a human agent. Both the work item and human agent are physical entities. Claim 12 is “useful” in that the utility is specific, substantial, and credible, namely to provide an algorithm for servicing work items by human agents. Claim 12 produces a concrete result, namely converting unserviced, pending work items into serviced work items. Claim 12 is directed to a tangible, and not abstract, idea. The claim is directed to a particular machine implementation of the mathematical algorithm that does not encompass every substantial practical application of an abstract idea.

The Examiner has rejected claims 9-11, 14-16, and 40-41 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. These claims have been amended to overcome these rejections.

The Examiner has rejected claims 9-11 and 14-16 under 35 U.S.C. §112, second paragraph, as failing to comply with the written description requirement. Claims 9-11 have been amended to overcome these rejections. Claims 14-16 are not identical to claims 9-11, as stated by the Examiner. Nonetheless, claims 14-16 have been amended to overcome any rejection under Section 112.

The Examiner seeks clarification as to the meaning of real time and business time. In response to the Examiner’s questions, a service time can be expressed as either a real time or business time value. A real time expression of service time ignores business and non-business time periods. An example of a non-business time period is a holiday or when a business is closed. A business time expression of service time includes only business time periods. The

Specification provides an example of this distinction at page 11, lines 3-8. In this example, the service time expressed as real time is 72 hours and as business time is 8 hours.

The Examiner next rejects Claims 1-4, 6-20, 31-32 and 40-41 under 35 U.S.C. Section 103(a) as being anticipated by Burok (US 2003/0152212) in view of Eder, “*Time Management in Workflow Systems*”.

Applicant respectfully traverses the Examiner’s rejections.

The cited references fail to teach or suggest at least the following italicized features of the pending independent claims:

1. A method for allocating resources, comprising:

providing a resource allocation system comprising (i) at least one queue of work items, each of the work items having an associated service time, and (ii) at least one resource to service the work items in the at least one queue;

placing, by a computer, a time delay, corresponding to a non-business time period, in at least one position of said at least one queue, whereby the non-business-time period is ignored in determining at least one of a service time and a time remaining in the at least one queue for work items positioned at queue positions farther from a head of the at least one queue than the at least one position of the time delay; and

based on the at least one of a service time and remaining time, allocating, by a computer, resources associated with said at least one queue to service work items according to predetermined algorithms.

12. A resource allocation system, comprising:

a plurality of human agents;

a plurality of queues for holding work items to be serviced by the plurality of human agents;

a scheduler operable, by a computer, to receive the work items, determine at least one of a service time and time remaining in queue for said work items, place said work items into a selected queue of the plurality of queues, and allocate human agents to service work items in the plurality of queues according to predetermined agent allocation algorithms;

a timer operable to track the at least one of a service time and time remaining in queue in said plurality of queues;

a plurality of electronic calendars corresponding to said plurality of queues, wherein each queue has an associated calendar, and wherein each calendar has entries corresponding to business time and non-business time,

wherein said scheduler is operable, by the computer, to monitor each of said calendars and, upon the start of a non-business time for a selected calendar, place a time delay corresponding to the length of said non-business time into the queue associated with the selected calendar, whereby the non-business-time period is ignored in determining the at least one of a service time and time remaining in queue for at least some of the work items in the queue associated with the selected calendar.

In one embodiment, a system and method address the problem caused by off-time intervals, such as weekends, holidays, and other non-business hours. To enter business hours, the system and method stop the business clock by scheduling the selected off-time interval onto the front of a delta queue. This changes the real-time scheduler into a business time scheduler by shifting all the business events in time by the off-time interval. Once the interval expires, the clock acts like a normal real-time scheduler. This can be important for accurately tracking the service times realized for non-real time contacts, such as email and instant messaging.

Burok

Burock, et al., are directed to a method for servicing a plurality of work items within committed times. A workflow including two or more work activities is assigned for each of the plurality of work items and a commitment is assigned either to each workflow or to each work item in each workflow. Queued work items are automatically assigned to a next available agent based on an activity state. A short-term predictor provides early detection of work items that are at risk of failing to meet their commitments. A long-term predictor detects backlogs of work items where excessive delays in queue are likely to put work items at risk of failing to meet their commitments. An activity's state can also cause additional reserve and backup agents to be assigned to it, to service work items from its queue before their commitments are missed.

Burok, et al., are silent on a number of claimed features, including a plurality of electronic calendars corresponding to said plurality of queues, wherein each queue has an associated calendar, and wherein each calendar has entries corresponding to business time and non-business time, and wherein said scheduler is operable, by the computer, to monitor each of said calendars (claim 12). Burok, et al., do not even mention a calendar. Providing a different calendar for each of a number of queues can have advantages. For example, in one configuration clocks for each calendar are stopped and started on its own schedule. Calendar rules for the various queues can be decoupled from one another. Finally, in one configuration rather than searching multiple calendars for each queue to determine rules regarding business and non-business time periods, the rules can be combined into a single calendar for each queue. These various benefits can reduce significantly processing resource usage and increase efficiency.

Burok, et al., further fails to teach or suggest *how* to account for non-business time periods in servicing work items. Regarding business and non-business time, Burok, et al., state in ¶[0057] as follows:

Work items have thresholds for individual work activities in the workflow. The thresholds are targets for the start of the activity. Referring to the threshold table of FIG. 5, there are three thresholds: a lower level threshold 140, an upper level threshold 150 and/or a critical threshold 160. The upper threshold is required, while the lower and critical thresholds are optional for proper operation. Referring to the workflow 100 of FIG. 2 in conjunction with the threshold table of FIG. 5, the first activity 110 is assigned an upper threshold 152. In this example, the commitment is 45 days to complete the workflow 100, and thus 10% is 4.5 days indicating that the first work activity should be started within 4.5 days. *When the enterprise performing the work activity is not typically a 24/7 operation, the time may refer to business days based on the operating hours of the business. If the enterprise operates between the hours of 8 am and 5 pm without overtime, 4.5 days would translate to 40.5 hours to complete the work activity. While the workflow 100 has a commitment of 45 days, the commitment could be in terms of working hours instead of days.*

(Emphasis supplied.)

As admitted by the Examiner (Final Office Action at page 11), nowhere do Burok, et al., teach or suggest accounting for non-business time periods by placing a time delay, corresponding to a non-business time period, in at least one position of said at least one queue, whereby the non-business-time period is ignored in determining at least one of a service time and a time remaining in the at least one queue for work items positioned at queue positions farther from a head of the at least one queue than the at least one position of the time delay (claim 1). See also claim 12.

These deficiencies are not overcome by the Eder reference.

The Eder Reference

The Eder reference is directed to time management functionality to control the lifecycle of processes. The reference describes how time information can be captured in the workflow definition, including a technique for calculating internal activity deadlines with a goal to meet the overall deadlines during process execution. The Eder reference discusses mapping time information to an actual calendar, assigning execution durations and deadlines to individual activities, specifying these deadlines relative to a beginning of a process, and at process instantiation using a calendar to convert all relative deadlines to absolute time points, modify the assigned deadlines or assign new deadlines. The Eder reference fails to state what “absolute” or “relative” mean? Does “absolute” mean real time or a calendar day? Does “relative” mean “business time” or a time interval measured from a calendar day?

Section 4 discloses, at run time, relative time information contained in the timed graph created during build time is transformed into absolute time points, internal activity deadlines are monitored, and remedial actions are taken when deadlines are violated.

Nowhere does the Eder reference suggest or disclose placing a non-business time period in a queue.

To overcome this deficiency, the Examiner takes official notice that it was well-known in the art at the time the invention was made to use delays in queues. Applicant disagrees and requests the Examiner under MPEP §2144.03(c) to support the finding with adequate written evidence. The Examiner attempts to rely on Burock, et al.; however, as noted above and as admitted by the Examiner at page 10 of the Final Office Action, Burock, et al., do not teach placing a time delay in a queue position. It only suggests, in some way and without explanation, converting a service time to a business time.

Accordingly, the pending claims are allowable.

The pending dependent claims provide further reasons for patentability.

By way of example, dependent claim 3 requires: wherein said selected position is at the head of said at least one queue, wherein said at least one queue is a delta queue, wherein a pointer indicates a next time out in the delta queue, wherein, in the delta queue, a service time associated with a selected enqueued work item is expressed as a delta value, a second delta value for a second work item at a second position of the delta queue being determined as a time difference relative to a first delta value for a first work item at a first position of the delta queue, and wherein the first position is nearer a head of the delta queue than the second position. *See also* claims 4 and 18. Neither Burock, et al., nor the Eder reference disclose a delta queue. Moreover, as noted above the Examiner is requested under MPEP §2144.03(c) to support the finding with adequate written evidence.

Dependent claim 6 requires said at least one queue to include a plurality of queues of work items, each of said plurality of queues having an associated calendar indicating business time and non-business time periods. As noted, neither Burock, et al., nor the Eder reference teach or suggest the user of a separate calendar for each queue. The Examiner relies on ¶[0057] for this proposition. As can be seen from the above quotation of this paragraph, this reliance is misplaced.

Dependent claims 8 and 9 collectively require the further steps:

displaying, at a user interface, a resource status associated with a first queue of said plurality of queues, the resource status being displayed in relation to a real time clock included in the resource allocation system;

determining service times for work items in said first queue;

selecting a calendar associated with said first queue;

converting each of the service times into an equivalent real time index; and

thereafter determining, for each of the real time indices, a corresponding business time interval. *See also* claims 13-14. The Examiner takes official notice of the fact that it was well known in the art at the time the invention was made to display a real time clock on a user interface. The Examiner is requested under MPEP §2144.03(c) to support the finding with adequate written evidence. Regarding the subject matter of claims 9 and 14, these steps are not taught by Burock, et al., or the Eder reference. As noted, Burock, et al., does not mention each queue having a corresponding calendar.

Dependent claim 10, which depends from claim 9, requires said indexing step to include:

selecting a minimum time interval;

determining, for the selected calendar, the calendar start time;

subtracting a selected real time from the calendar start time to provide a relative real time;

taking the modulus of the relative real time by the minimum time interval to output a corresponding real time index; and

converting the real time index into a corresponding business time index. *See* claim 15.

Neither Burock, et al., nor the Eder reference teach or suggest the use of the modulus operation to produce a real time index or a business time index.

Dependent claim 17 requires said scheduler to be operable to:

access a business time calendar which includes information corresponding to business time and non-business time;

determine when a non-business time period begins; and

place a duration of said non-business time period into said queue to indicate when said non-business time begins.

As noted, neither Burock, et al., nor the Eder reference teach or suggest placing a time delay corresponding to a non-business time period into a queue position.

Dependent claim 32 requires the time delay to stop a clock associated with the at least one queue for the duration of the time delay. The Examiner takes official notice that it was well known in the art at the time the invention was made to stop clocks for time delays (e.g., sports contests). The Examiner is requested under MPEP §2144.03(c) to support the finding with adequate written evidence. Even if official notice is proper, the official notice does not teach or suggest a time delay itself stopping a clock.

Dependent claim 40 requires the steps:

selecting a real time, the real time being related to a state of a work item;
determining, for the selected real time and by a computer, a real time index into a real time-to-business time conversion table; and

determining, from the real time-to-business time conversion table and by a computer, a business time interval. *See also* claim 41. The Examiner incorrectly characterizes the Eder reference as teaching converting real time to business time and takes official notice that it was well known in the art to convert between time scales using an index. Regarding the former point, the Eder reference discusses converting relative deadlines to absolute time points. As noted, it is far from clear that relative deadlines and absolute deadlines correspond to business and real time or vice versa. Regarding the second point, the Examiner is requested under MPEP §2144.03(c) to support the finding with adequate written evidence.

Applicant has added new Claims 42-50, which provide reasons for allowability. In particular, neither the Burock, et al., nor Eder reference teach or suggest at least the following italicized features of independent claim 42:

In a contact center, a method comprising:
providing a plurality of resources to service incoming work items and a plurality of queues for the work items;
determining, by a computer, a first index to a conversion table;
mapping, in the conversion table and by a computer, the first index to provide a second index;
converting, by a computer, the second index into a corresponding second time, wherein the first time is in at least one of business time and real time and the second time is in the other one of business time and real time; and
based on the second time, selecting, by a computer, a resource to service a selected work item.

Based on the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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